Eskom	Scope of Work	Hendrina Power Station

Title:	**Scope of Work for the Maintenance of The Fire Protection System at Hendrina Power Station for the period of 5 years**	Unique Identifier:	**380-137446**
		Alternative Reference Number:	**N/A**
		Area of Applicability:	**Engineering**
		Documentation Type:	**Scope of Work**
		Revision:	**0**
		Total Pages:	**23**
		Next Review Date:	**N/A**
		Disclosure Classification:	**CONTROLLED DISCLOSURE**

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TABLES

1. INTRODUCTION

This Scope of Work document outlines the specific tasks, deliverables, and timelines for the work to be undertaken by the successful contractor, as evaluated based on the requirements specified in the Tender Technical Evaluation Strategy and other assessments, in the form of a five (5) year service contract. The contract aims to provide the business with a competent, reliable, and consistent source of plant maintenance for the Fire System, and this document serves as a guide for all stakeholders involved, ensuring a clear understanding of the project's scope, responsibilities, and expectations.

A maintenance contract is required for the fire protection system at Hendrina Power Station. The maintenance contract will involve the inspecting, testing, and maintenance of the fire protection system consisting of deluge systems, sprinkler systems, pumping systems, and passive fire protection. The contract also highlights the supply, install and commissioning of fire protection systems across the station.

2. SUPPORTING CLAUSES

2.1 SCOPE

The scope comprises of the inspection, testing, and maintenance of the fire protection system consisting of deluge systems, sprinkler systems, pumping systems, and passive fire protection.

2.1.1 Purpose

The purpose of this document is to provide the scope of work for the fire protection system maintenance contract at Hendrina Power Station.

2.1.2 Applicability

This document shall apply to Eskom Hendrina Power Station

2.2 NORMATIVE/INFORMATIVE REFERENCES

2.2.1 Normative

[1] ISO 9001 Quality Management Systems

[2] Occupational Health and Safety Act 85 of 1993

[3] National Building Regulations and Building Standards Act 103 of 1977

[4] EST 32-124 Eskom Fire Risk Management

[5] 240-54937654 Inspection, Testing and Maintenance of Fire Detection Systems

2.2.2 Informative

[6] 240-54937450: Fire Protection & Life Safety Design Standard

[7] NFPA 20: 2025 - Standard for the Installation of Stationary Pumps for Fire Protection

[8] NFPA 22: 2023 - Standard for Water Tanks for Private Fire Protection

2.3 DEFINITIONS

2.3.1 Active fire protection

Active fire protection consists of all fire protection systems that are actuated in the event of a fire and need to operate in terms of discharging a suppression medium.

2.3.2 Approved

In the context of fire protection, this signifies components, devices or assemblies having been tested and accepted for a specific purpose or application by a locally or internationally recognised testing laboratory.

2.3.3 Fire Door

Automatic or self-closing door assembly which complies with the requirements contained in SANS 1253, and which is especially constructed to prevent the passage of fire for a specific length of time.

2.3.4 Fire-Rated Penetration Seal

An approved product used to seal an opening in a fire barrier for the passage of pipe, cable, duct, etc. so as to maintain a fire rating that is commensurable with that of the fire barrier.

2.3.5 Passive Fire Protection

A passive fire protection system is preferred above active fire protection. Because it is passive, it does not require any mechanical or electrical parts that can fail in the event of a fire. These systems include spatial separation from other areas, containment areas, drainage, fire separation barriers, fire breaks, fire retardant cables, etc.

2.3.6 Sprinkler System

A network of piping connected to a reliable water supply that will distribute the water throughout the area protected and will discharge the water through sprinklers in sufficient quantity either to extinguish the fire entirely or to prevent its spread. The system, usually actuated by heat, includes a controlling valve and a device for actuating an alarm when the system is in operation. The following categories of sprinkler systems are defined in NFPA 13.

2.3.7 Water Deluge System

Networks of piping similar to a sprinkler system, except that it utilizes open-head spray nozzles.

2.4 ABBREVIATIONS

Abbreviation	Description
CM	Corrective Maintenance
FM	Factory Mutual
LPC	Loss Prevention Certification
MJC	Multi Jet Control
NB	Nominal Bore

Abbreviation	Description
NFPA	National Fire Protection Association
PPE	Personal Protective Equipment
PM	Preventative Maintenance
SANS	South African National Standard
SAP	System Application and Products
SOW	Scope of Work
QCP	Quality Control Plan

2.5 ROLES AND RESPONSIBILITIES

- Auxiliary Engineering – Compilation of the maintenance scope of work required to ensure optimal performance and reliability of the system.
- Auxiliary Maintenance – Managing and expediting the fire protection system maintenance contract. Ensuring that the scope of work is being executed by the Contractor. Ensuring that the works management process is followed during contract duration.
- Maintenance Contractor – Executing the tasks as per the maintenance contract and scope of work.

2.6 PROCESS FOR MONITORING

N/A

2.7 RELATED/SUPPORTING DOCUMENTS

N/A

3. SCOPE OF WORK

3.1 TECHNICAL SCOPE OF WORK

The scope of work entails inspection, testing and maintenance of the fire water mains, fire water tank, diesel engines, fire pumps, deluge and sprinkler systems and passive fire protection systems as per Table 1. The Contractor will also be responsible for attending to all defects raised by OPS or any other Eskom individual at Hendrina Power Station. The scope includes normal preventative maintenance (PM) and corrective maintenance (CM), emergency work and outage work. The maintenance of the fire system shall be done according NFPA 25, this standard is on internet and other search.

- The Contractor provides the complete maintenance of the Fire Protection system in a manner that ensures minimal interruption to the Fire Protection system and minimizes the number of and duration of impairments, so as not to constrain any operation of the Employer or place the safety of personnel and equipment at significant risk.
- The Contractor attends the maintenance/operating meetings, arranged by Production at the designated venue.
- The Contractor plans maintenance schedules in co-operation with the Employer. These plans are submitted to the Service Manager for acceptance before the Contractor starts with any work on site.
- The Contractor should be registered with National Fire Protection Association (NFPA 25): Standard for inspection, testing and maintenance of water-based fire protection systems within 3 months of contract start date

3.2 CONTRACT PERFORMANCE

- Provide a 24 Hours service, seven (7) days per week and weekends when required.
- Adherence to Plant Safety Regulations and Hendrina instructions for impairment process
- Optimisation of the system availability and equipment to reduce cost, maintain and enhance the condition of the equipment.
- Conduct inspection and testing of all equipment to assess and monitor equipment condition
- Perform maintenance work in accordance of specified standard procedures and check sheet as agreed between the Contractor and Employer
- All work performed within the parameters of the scope of work and standard procedures
- Ensure that he work is performed to the highest standard and safety standards and regulations.
- All equipment isolated for maintenance intervention shall be re-commissioned after start-up and recorded in history on SAP-PM
- Ensure planned maintenance and reduced plant breakdowns

3.3 INSPECTION, TESTING AND MAINTENANCE REQUIREMENTS

- The Contractor will be required to conduct routine inspections, mechanical repairs and inspections in accordance with the details and inspection frequencies as per the scope of work in Table 1.
- Identify, report, plan, repair any defects on the mechanical components and replace any defective components as per Maintenance Strategies.
- Equipment inspection will be inspected daily, weekly, monthly, quarterly and yearly or as and when required as per Maintenance strategies and condition monitoring tests.
- The Contractor is further expected to liaise daily with the Operating Department/Maintenance Department to plan work and to optimise the availability of the plant
- The Contractor will also be required to load defects on the SAP and/or FLIP system. The Contractor may be required to load defects on the system via assistance from Operating Department.

- The Contractor may be requested by the Employer to conduct plant modifications as per Engineering instructions or SOW's.
- All work must be executed by qualified and trained personnel using the correct tools and equipment to ensure a reliable plant. Quality inspections to be done on all defects that are completed with Eskom personal signing it off.
- All personnel working on the Fire Protection System will be required to have attended basic deluge system training and must be deemed to be competent in fire system maintenance
- The Contractor must document all findings from the inspection, testing and maintenance tasks via inspection sheets or check lists. A logbook of all findings must be provided.
- The Contractor must provide a programme indicating how their resources will be allocated to execute the tasks according to their frequencies as per Table 1 and Table 2
- Where cleaning of bund walls is required, the Contractor must provide all necessary equipment and consumables for cleaning such as vacuum truck, chemicals, rags etc.
- The Contractor may utilize the existing station scaffolding contract where scaffolding may be required.
- Inspection of diesel engines, conducting performance testing of the diesel engines water pumps.

3.3.1 Maintenance philosophies

The Contractor will be responsible for preventative maintenance and corrective maintenance. The defects found and corrective actions will be planned according to the priority of the defects. The detailed planning of critical/major activities, together with QCPs, risk assessments, project plan and method statements will be done by the Contractor and approved by the Contract Supervisor/Engineer. Auxiliary Maintenance will assist the contractor in doing Plant Safety Regulations (PSR) training. Once trained the contractor employees will take their own permits.

3.4 QUALITY CONTROL PLANS (QCP'S), SAFE WORK PROCEDURES AND JOB OBSERVATIONS

The Contractor will be required to develop and submit QCP's for the Employer's approval. QCP's with action plans, safe work procedures and job observations shall be produced at the request of the Employer. QCP's must be signed and approved by the Quality Controller, System Engineer and Auxiliary Plant Maintenance Supervisor.

3.5 DEFICIENCIES AND MODIFICATIONS

No modification shall be done on the plant and equipment without notifying the Employer and System Engineer or Contract Manager.

3.6 EXPERIENCE

The following experience and qualified skills will be required:

- Site Manager - Technical National Diploma (NQF 6) with minimum of 5 years' experience.
- Supervisor - N6 qualifications with trade certificate with minimum of 4 years' experience post trade certificate.
- Mechanical artisans - N3 mechanical engineering with trade certificate with minimum 3 years' experience post trade certificate.
- Diesel Mechanic – N3 technical qualification with trade certificate with minimum 3 years' experience
- Welders with 3 years' experience post certification.

Support Structure

- General workers

4. HEALTH, SAFETY AND ENVIRONMENTAL REQUIREMENTS

The Contractor shall follow all Eskom's safety requirements including all lifesaving rules and regulations required to perform the work. Compliance with all current legislation and Eskom policies and directives is mandatory.
The Contractor must comply with the following legal and other requirements throughout the duration of the contract:

- Occupational Health and Safety Act 85 of 1993
- Eskom Life Saving Rules
- COIDA Act
- Eskom OHS Specifications
- Eskom SHEQ inductions
- Safety File Evaluation
- Environmental regulations

- The Contractor will abide by the SHE requirements of Hendrina Power Station.
- The Contractor must ensure that all his personnel attend a Health and Safety Induction course prior to starting with their work. The induction course can, on request, be provided by the Employer and will e valid for the duration of one year.
- The Contractor shall ensure cleaning of work areas and disposal of any waste materials generated in execution of the scope.
- Safety Risk Management has the right and authority to visit and inspect the Contractor's workplace or site establishment to ensure that tools, machinery and equipment comply with the minimum safety requirements.
- The Auxiliary Plant Maintenance Manager shall be entitled to instruct the Contractor to stop work, without penalty to the Employer, where the Contractor's personnel fail to conform to safety standards or contravene health and safety regulations. The Auxiliary Plant Maintenance Manager is entitled to call the Contractor to discipline his/her employees and to enforce disciplinary action. The Contractor will be required to submit a report to the Auxiliary Plant Maintenance Manager. The Contractor shall implement additional health and safety precautions where necessary.
- The Contractor will provide all his personnel with the required PPE for the duration of the contract. Risk Assessments, Pre-Job Briefs, Post-Job Briefs and Job Observations will be conducted for all jobs.
- All Construction Regulation safety requirements should also be adhered to including Safety and Fall Protection Plan

5. SECURITY MANAGEMENT

The Contractor applies for access permits (Contractor's permit) at the Security gate on the start date of the contract. The Contractor's personnel shall be required to be in possession of an access permit at all times.

In order to assist Protection Services with the issuing of permits and the identification of personnel on site, the successful Contractor is to supply a list of all personnel that the Contractor intends using on site, at

least 72 hours prior to entry of the Security Area. This list must be delivered to Protection Services. The list identified with the Contractor's name is to contain the following information:

- Employee name
- Employee ID
- The Employer's Safety Coordinator's signature
- Auxiliary Plant Maintenance Manager's signature
- Copy of the first page of the ID book of every employee of the Contractor, photocopied to reduce the size to 65%

Access permits must be returned to Protection Services when the worker/s leave the site, either after completion of the services, or upon earlier termination of service of a worker during the contract period.

To speed up the process of gaining access to the site, the Contractor must compile detailed lists of all tools and equipment (including serial numbers where applicable) to be taken on site before arriving at the Power Station Security gate. An authorised copy of this list must be retained by the Contractor - to be used again when the tools and equipment are removed from site after the completion of the services.

Any additional tools or equipment brought to site, or any tools or equipment removed during the contract period must be reported to Protection Services and all lists amended likewise. Gate release permits will not be issued for the removal of any tools or equipment not specified on the tool list.

The Contractor's visitors and all personnel shall conform at all times to the security arrangements in force at the site. Application forms for visitors must be filled in by the Contractor's Site Manager and approved by the Auxiliary Plant Maintenance Manager, one day before the visit and submitted to the Employer's Protection Services office. Visitors will not be allowed on site if the necessary forms are not in the possession of the security staff.

The Chief of Protection Services may, with valid cause, remove any, of the Contractor's personnel from the site, either temporarily, or permanently. He may deny access to the site to any person whom, in the opinion of the said Chief of Protection Services, constitutes a security risk.

No unauthorised vehicles will be allowed on site. Only Contractor's vehicles with displayed Contract Vehicle Permits disks will be allowed on site. Contract vehicle applications should be directed to the Auxiliary Plant Maintenance Manager.

The Contractor will be restricted to the working areas associated with his place of work. The Contractor is forbidden to enter any other areas and must ensure that his employees abide by these regulations.

No recruiting of casual labour may be done on the Employer's premises, including the area outside the Power Station Security Gate.

6. QUALITY REQUIREMENTS

The Contractor will comply with the Employer's Quality Requirements.

Quality Requirements include visual inspection by the Employer, who will be entitled to witness progress of work at any time. The Employer shall also have the right to stop work and re-instruct the Contractor, who will comply with the requests.

The Employer may by arrangement, inspect completed work. If in the opinion of the Employer, the work does not comply with the quality requirements expected from the Contractor, the Employer shall instruct the Contractor to rectify the faults. The Contractor will comply with the instructions.

The Contractor shall compile commissioning reports for each pump that will meet the quality standards.

The Contractor shall utilise the Employer's quality documentation management system and processes to ensure compliance and standardisation.

7. SERVICES AND OTHER REQUIREMENTS

7.1 USE OF EMPOLYERS EQUIPMENT

If the Contractor requires use of any of the Employer's Equipment, including compressed air, electricity, water supply and cranes, it must be requested via the Supervisor.

The Contractor will be responsible for the repair, replacement or correction as necessary of any and all items of plant and /or materials supplied by the Employer which are damaged and /or lost whilst in the Contractor's custody and control.

The Contractor Site Manager must ensure that any one of his employees or sub-contractors, operating hoist equipment belonging to the Employer, is authorised by the Employer.

7.2 ACCOMODATION AND CATERING

The Contractor will be responsible for the provision of accommodation to his personnel - the Employer does not provide accommodation.

The Contractor or any of his employees or sub-contractors will be allowed to use the Employer's dining facilities.

The Contractor or any of his employees or sub-contractors may also buy take away meals from the fast-food outlet on site.

7.3 OFFICE AND TOILET FACILITIES

The Employer will provide the Contractor access to office and toilet facilities.

7.4 REFUSE DISPOSAL

The Employer will provide and empty special colour coded bins for refuse disposal. The Contractor will be responsible for refuse bins for his own site.

The Contractor ensures that all workers under his control strictly adhere to the correct use of refuse bins.

For the full duration of the services, the Contractor is responsible to keep the work area clean of any rubble and to place all refuse into the bins provided.

Table 1: Fire Protection System Scope of Work

No	Item	Action required	Frequency	Additional information
INSPECTION - WATER RETICULATION MAINS				
1.1	Water supply isolation sectional and isolation valves	a) CHECK that all sectional valves are secured in the correct operating position with padlock and chain.	Monthly	Ensure locks and chains used as securing devices are sturdy and resistant to breakage except by heavy cutting devices
		b) CHECK all underground key-operated valves if in the correct operating position	Monthly	
		c) CHECK ring-main sectional isolation valves within the station.	6 Monthly	
1.2	All sectional valves and other distribution components	CHECK all sectional valves reticulation isolating valves, pressure gauges, strainers and non-return valves for leaks and signs of physical damage.	Monthly	
1.3	Installation survey	Pipework—CHECK that exposed water distribution system, including pipework, pipe supports and valves appears free from corrosion and damage, and not subject to external loads and pipework is properly supported.	Yearly	
TEST – WATER RETICULATION MAINS				
2.1	Water *reticulation sectional and isolation valves status (Stroke test)	a) OPERATE all water supply sectional and isolation valves including underground key-operated valves from fully open to fully closed.	Yearly	Return all valves to original position after test. Record all results on valve test log.
		b) VERIFY that the valve position indicators are securely mounted and indicate correctly.	Yearly	
2.2	Non-return valves	VERIFY that all non-return valves are operating freely and are seating correctly	Yearly	
INSPECTION – FIRE WATER TANK				
3.1	Tanks – with mechanical / hydraulic water level gauge	a) CHECK that the tank is full and that the level indicator reads correctly.	Weekly	
		b) CHECK mechanical gauge moving components for corrosion, wear and tear	Weekly	
3.2	Tanks - atmospheric	INSPECT externally tank condition, supporting structure (plinths, steel supports, etc.), fittings, nozzles, and acceptable condition of roof, hatches and ladders, external corrosion.	Weekly	

No	Item	Action required	Frequency	Additional information
3.3	Plant labelling	CHECK if all plant labelling and reference labels are provided, properly affixed and legible.	Weekly	
PREVENTATIVE MAINTENANCE – FIRE WATER TANK				
4.1	Tanks - atmospheric	REPLACE inlet valve washer and lubricate the float mechanism. Lubricate water level indicator, pulleys and cables and check indicator	Yearly	
4.2	Painting	REPAINT tank externally and internally as well as supporting structures	As required	
INSPECTION – FIRE PUMP SETS AND FUEL SUPPLIES				
5.1	Pump areas	a) CHECK that pump areas are unobstructed (i.e. free access around the pump sets without hindrance),	Weekly	
		b) CHECK that pump areas are not used for storage (i.e. no storage of combustible materials, flammable liquids, flammable gasses, spare motors or components) and that area is generally clean and free from fuel, oil and water spillages on the floors.	Weekly	
		c) CHECK that pump area lighting is adequate (i.e. no blown lights, broken light fittings, dark areas around the pumps. If insufficient, add more lighting.	Weekly	
		d) CHECK that the discharge from the pressure relief valve will not cause flooding or water damage (i.e. water discharge correctly directed into sump drains, terminating with an elbow facing the sump pit, etc.)	Weekly	
5.2	Valves	a) CHECK that all valves are in the operating position (as indicated on the P&ID or mimic drawing), and	Weekly	
		b) CHECK that all the critical valves are secured against tampering where applicable.	Weekly	
5.3	Pressure gauges	a) CHECK that correctly ranged pressure gauges are installed and in an operative condition	Weekly	Record pressure gauge readings
		b) CHECK that gauges are defect free and legible (free from physical damage, lens clear with no fading, paint, dirt, oil, etc). Where fitted, check that glycerine levels of gauges are at the correct level and no leaks are found.	Weekly	
		c) INSPECT stop valves on gauges and ensure it is in the OPEN position.	Weekly	

No	Item	Action required	Frequency	Additional information
		d) RECORD pressures and check that it is within the ranges indicated on the pressure gauge schedule. Pressure should be within ±3% of normal operating	Weekly	
5.4	Auto start arrangement	a) Pressure Switches CHECK for mounted securing to pipe work tapping point, physical damage and gland is in place and secure. All removable covers are securely closed and IP rating requirements are still maintained.	Weekly	
		b) Signal Cabling CHECK that all signal cables are free from physical damage, terminated into the switch, conduit is securely mounted, flexible metal conduit (sprag) is in good condition and securely fixed.	Weekly	
		c) Pressure Gauges CHECK that gauges are defect free and legible (free from physical damage, lens clear with no fading, paint, dirt, oil, etc). Where fitted, check that glycerine levels of gauges are at the correct level and no leaks are found.	Weekly	
		d) NRV's CHECK that NRV's are installed in each sensing line and follow the flow direction correctly ad leak free at joints,	Weekly	
		e) Valves CHECK valves are in correct operating position (fully open or fully closed), leak free, no damage on handles and spindles,	Weekly	
		f) Mimic Diagram ENSURE that a mimic diagram is provided, securely fixed in position, legible and clean. CONFIRM component labelling correspond with mimic diagram.	Weekly	
5.5	Fuel Tanks	a) CHECK that fuel gauges are defect free and legible (free from physical damage, lens clear with no fading, paint, dirt, oil, etc)	Weekly	
		b) CHECK the fuel level and ensure that the fuel tank is not less than ¾ full. If less than ¾ full then refill or notify ops to refill.	Weekly	
		c) CHECK fuel supply pipes for condition and defects i.e. properly supported, no dents, no leaks, external corrosion, etc.	Weekly	
		d) Flexible hose connections between the fixed supply lines and the diesel driver must be of metal braded hose with no leaks, sharp bends or exposure to hot surfaces.	Weekly	

No	Item	Action required	Frequency	Additional information
		e) CHECK fuel tank for signs of leakage, corrosion, adequacy of support, breather connection free of obstruction and routes to the outside.	Weekly	
		f) CHECK fuel supply lines to be locked in the open position. Fuel tank drain valves where fitted must be locked in the closed position.	Weekly	
		g) CHECK bund wall enclosure below fuel tank for physical damage to walls and floor, drainage, accumulation of combustible materials, etc.	Weekly	
5.6	General inspection	a) CHECK for any obvious signs of physical damage or deterioration.	Monthly	
		b) INSPECT pump plinths (Cracks, spalling, mechanical anchor corrosion, corrosion of pump skids, etc.	Monthly	
		c) INSPECT pipes, pipe plinths and supports for adequacy of support, pipe movement, corrosion, loose/defective U-bolts, leaking, etc.	Monthly	
5.7	Diesel driven pump engine start batteries	a) CHECK engine start batteries and charging equipment for lose terminals, corrosion at terminals, damage cabling	Weekly	Record battery charger panel Voltage and Current
		b) CHECK fire pump start batteries for lose terminals, corrosion at terminals, damaged cabling, electrolyte levels, battery damage and deformity.	Weekly	
		c) Check electrolyte level in batteries d) CHECK battery charger panel Current & Voltage meters for correct readings and record	Weekly	
5.8	Diesel engine pump control panel	a) CHECK enclosure for corrosion and the ingress of water, dust or insects. CLEAN and Rectify any defects noted.	Weekly	
		b) CHECK operation of all visual indicators, switches and sounders. REPLACE any defective indicators and components and retest function.	Weekly	
5.9	Plant labelling	CHECK if all plant labelling and reference labels are provided, properly affixed and legible.	Weekly	
TEST – FIRE PUMP SETS AND FUEL SUPPLIES				
6.1	Precautions	Prior to commencing any test function: a) CHECK all safety guards are in place and secured.		
		b) Where diesel driven pump-sets are installed, CHECK engine coolant (radiator), engine cooling line valves in open position (inter-cooler / heat exchanger), engine oil, diesel fuel levels and belt drives. Check fuel water-trap/filter for water contamination. Rectify where low levels are observed.		
		c) Check and record diesel driver hour meter reading prior to commencing the test run.		

No	Item	Action required	Frequency	Additional information
		d) CONFIRM, with the Control room Operator, prior to starting the fire pumps, that the test run is about to start.		
6.2	Pressure gauges	Prior to commencing any test function, RECORD pressure readings from water supply (suction) and system pressure (discharge) gauges.		Suction.....kPa Discharge.....kPa
6.3	Fire Pump Control Panel and Engine Start Batteries	Perform 6.1 and 6.2 prior to test a) TEST the float charge voltage of both the i. fire pump control panel and ii. engine start batteries and record the result.	6 Monthly	Amps ..... Volts..... Amps ..... Volts.....
		c) Battery charger power failure alarm operates correctly.	Weekly	Simulate power failure by isolating power supply of charger at the respective circuit breaker.
6.4	Fire Diesel Engine Pump Auto starting arrangement – function test	a) START each diesel pump-set by reducing the applied water pressure on the Auto Start Arrangement sensing line and run engine continuously for not less than 30 min on the first automatic start and Check & Record that the driver achieves full speed within 15 seconds of starting.	Weekly	Main Diesel #1: .rpm (after 15 seconds) Main Diesel #2: … .rpm (after 15 seconds
		b) RECORD the pump cut-in pressures and verify that they are within the set-point as indicated on the pressure gauge schedule / mimic drawing. RECORD the Oil Temperature, Engine water temperature, Engine Oil Pressure and Engine Running Speed	Weekly	
		c) RECORD the Suction & Discharge pressures, test run time and the hour meter reading prior to the test.	Weekly	Suction:…..kPa Discharge: kPa Test: …..mins Hour Meter: …hrs
		d) CHECK that pump gland packing and mechanical seals are not leaking		
		e) VERIFY that there are no abnormal vibrations or abnormal sounds. If evident, stop the test		
		f) VERIFY that the local and remote “pump running” alarms operate		
		g) Running speed is correct and record the result		
		h) Water, oil and fuel leaks are not evident and theres no leaks from pipes or pumps		
		i) Main diesel driver Battery charger / alternator is operating correctly. RECORD Amp rating		
		j) CHECK that the mechanical engine stop mechanism on the diesel driver returns to start position automatically		
6.5	Diesel driven pump sets Annual Pump Performance Test (Engine Fails To Start)	SIMULATE an engine fail to start by means of either automatic mode or manual mode. . Proceed as follows:	Yearly	

No	Item	Action required	Frequency	Additional information
		The fail-to-start alarm shall operate after the sixth cycle of cranking, when the following sequence is carried out: Automatic Mode: 1) Isolate the fuel supply; 2) Select pump mode to AUTO START 3) By means of the pump test arrangement simulate a controlled pressure drop for the pump being tested 4) Witness and record the time for engine cranking (not less than 15 seconds) by the pump controller 5) Witness and record 10 second pauses between crank cycles of the engine 6) A total of six crank cycles should occur before the pump controller goes into a PUMP FAIL condition. 7) REINSTATE the fuel supply and proceed with manual start of pump, allow for a 5minute test run to ensure functionality is restored. OR Manual Mode: 1) Isolate the fuel supply; 2) With the pump controller in MANUAL MODE crank the engine for not less than 15 seconds; 3) Stop the cranking for not less than 10 seconds and not more than 15 seconds; 4) Repeat (2) and (3) a further five times; and 5) A total of six crank cycles should occur before the pump controller automatically goes into a PUMP FAIL condition. 6) REINSTATE the fuel supply and proceed with manual start of pump, allow for a 5minute test run to ensure functionality is restored. Ensure that engine-start cycling requirements and alarm activations are satisfied		
PREVENTATIVE MAINTENANCE – FIRE PUMP SET AND SUPPLIES				
7.1	Batteries	a) REPLACE control panel batteries in accordance with manufacturer's recommendations.	As per OEM	
		b) REMOVE any corrosion from battery terminals.	Monthly	
7.2	Diesel Engine Maintenance	As per manufacturers recommendation	As per manufacturers recommendation	
INSPECTION – SPRINKLER AND DELUGE SYSTEMS				
8.1	Main Isolation valve and trim valves	CHECK that the main Isolation valve(s) and trim valves in each control assembly are secured in the open position and correctly labelled	Weekly	

No	Item	Action required	Frequency	Additional information
8.2	Water motor alarm gong	INSPECT all water gong components as per the installation specific mimic drawing for defects and damage.(i.e. test line isolation valve, NRV, strainer, alarm gong body, etc.) Note: Y-type strainers must be installed in a horizontal position with the basket pointing down wards. CONFIRM flow direction is correct on strainers and non-return valves. INSPECT area below alarm gong discharge pipe to ensure free flow of water from the discharge opening.	Weekly	
8.3	Pressure gauges	CHECK that all pressure gauge readings are within the ranges indicated on the pressure gauge schedule. Pressure should be within ±3% of normal operating pressure (10 bar). CHECK for & RECORD that gauges are defect free and legible (free from physical damage, broken needles, lens clear with no fading, paint, dirt, oil, etc). Where fitted, check that glycerine levels of gauges are at the correct level and no leaks are found. INSPECT stop valves on gauges and ensure it is in the OPEN position.	Weekly	Installation: kPa Below stop valve: kPa Water supply 1: kPa Water supply 2: kPa RECORD any damage and defects as found for corrective action.
8.4	Pressure switches	CHECK for mounted securing to pipe work tapping point, physical damage and gland is in place and secure. All removable covers are securely closed and IP rating requirements are still maintained. Signal Cabling: CHECK that all signal cables are free from physical damage, terminated into the switch, conduit is securely mounted, flexible metal conduit (sprag) is in good condition and securely fixed.	Weekly	Grommets and gauge fronts to be in a good condition.
8.5	Control valve assembly area	CHECK that control valve assembly area is unobstructed and is not used for storage of any materials whether combustible of non-combustible.	Weekly	
8.6	Sprinkler head condition	a) CHECK that sprinkler heads appear free from mechanical damage, corrosion and paint on operating elements or cover plates.	Quarterly	Note that this activity must occur once of upon contract award and then every 4 months.
		b) CHECK for poorly fitting or missing escutcheons or cover plates, damaged guards, and attachment of foreign material.	Quarterly	
		c) CLEAN sprinklers using soft cloth with water	Quarterly	
8.7	MJCs	CHECK in situ for evidence of paint loading, external corrosion, etc. Replace if necessary. REPLACE if defective	Quarterly	
TEST – SPRINKLER AND DELUGE SYSTEMS				

No	Item	Action required	Frequency	Additional information
9.1	Alarm gong test	a) OPERATE each alarm valve by opening the test valve b) RECORD time(s) to operation of alarm gong(s) and verify that these do not exceed 180 s. c) During the flow test VERIFY pressure switch responds accordingly and alarm signal is received in the relevant control room.) d) TEST all alarm-initiating devices (flow and pressure switches) e) VERIFY that water alarm gong is functional and clearly audible above ambient noise levels.	Quarterly	Note that this activity must occur once of upon contract award and then every 4 months.
9.2	Main drain valve water supply test	a) OPEN the main drain valve.	6 Monthly	Before test water supply pressure … kPa
		b) VERIFY that residual water supply pressure, with drain valve open, is within 10% of the value recorded on the pressure gauge schedule.		Stabilize flow water supply pressure kPa
		c) Slowly CLOSE main drain valve and record time for pressure recovery.		Time for pressure recovery ……s
		d) VERIFY that the time for pressure recovery aligns with previously recorded value.		Note that this activity must occur once of upon contract award and then every 6 months.
9.3	Full flow trip test	Caution: Performing this test results in operation of the deluge valve. Water will flow from open sprayers or nozzles. a) CONFIRM that precautions have been taken to prevent damage. b) Fully OPEN the flow test or main drain valve to flush away any accumulated foreign matter. CLOSE the flow test valve. c) TRIP the system by operating the release system. Allow water to pass through the deluge valve. d) CONFIRM that water flow alarms operate. e) When test is complete, close the main water supply isolating valve. Close the priming valve. Open the auxiliary drain valve and all system drain valves to drain water from the spray nozzle water piping f) PERFORM semi-annually maintenance. g) Place the system back into operation	Annually	
9.4	MJCs	TEST the MJCs by opening the drain valve on each MJC to check if the system activates.	Annually	
PASSIVE FIRE PROTECTION SYSTEM				
ITM FOR STRUCTURES AND CABLES/COATING				

No	Item	Action required	Frequency	Additional information
10.1	Concrete structures	CHECK areas that have concrete along piping through walls. If so, repair the walls to ensure fire rating of the area is maintained.	Annually	
10.2	Fire protection system/coating — Thickness	CHECK visually for areas of non-compliance: a) If mineral coating, loss of adhesion, tap on coating to check for uniform adhesion. b) Mechanical damage, intumescent coating or flaking c) If fire protective boards, missing boards, loss of adhesion or mechanical damage. d)CHECK for cables, pipes, ducts etc that are not properly sealed along walls. REPAIR such defects by using approved Fire Rated-Penetration Seals	Annually	Note that this activity must occur once of upon contract award and then every 12 months.
10.3	Bund walls	CHECK that bund walls are clean, drained and there are no oil settled inside. If so, CLEAN bund wall area.	2 Monthly	Note that this activity must occur once of upon contract award and then every 2 months
ITM FOR HINGED AND PIVOTED FIRE-RESISTANT DOORS				
11.1	Marking— Tags and signage	a) CHECK door leaves and door frames have a tag bearing the information contained in SANS 1253 b) CHECK to ensure relevant signage is applied.	6 Monthly	Note that this activity must occur once of upon contract award and then every 6 months.
11.2	Clearances in the closed position	CHECK: a) Top: Gaps between the edge of the door leaf/leaves and the frame do not exceed 3 mm at the head.	6 Monthly	
		b) Sides: Total width of the clearances between the vertical sides of the leave of a single-leaf door-set and the frame does not at any cross-section exceed 6 mm. In the case of a double-leaf hinged door, the clearance between one meeting stile and the other, and the clearance between the frame and the leaves shall not exceed 4 mm. c) Bottom: Gaps are not less than 5 mm and not more than 12 mm at the threshold	6 Monthly	
11.3	Hardware— General	a) CHECK all essential hardware required for suspension, closing and latching is fitted and is a make and model that has been fire tested for the specific proprietary fire-resistant door construction.	Annually	

No	Item	Action required	Frequency	Additional information
		b) CHECK all hardware is attached in accordance with the requirements of SANS 1253 and is securely fixed. c) CHECK the door leaf is free from non-approved fittings, fixings or attachments and free from damage caused by relocation of hardware items.		
11.4	Door closes and pivots	CHECK a) The closer arm and any pivots operate freely and smoothly. b) The door-set is free from any closer oil leakages. c) The screw fixing and mounting arrangements for door closer are secure to the door leaf and door frame. d) The door closer body is free from obstructions by walls, fixtures and/or fittings at any point throughout its swing. e) The door closes fully and latches. f) Cushioned back-checking action takes place as per the requirements of SANS 1253 g) For doors with magnetic hold-open devices, the door leaf comes to the fully closed and latched position upon release of the hold-open device.	Annually	
11.5	Hinges	CHECK: a) Hinges are free from any undue wear and tear and are correctly aligned and operating smoothly and freely. b) Hinges are securely fixed to the door leaf and frame. c) Hinge pins are home.	Annually	
11.6	Door seals	CHECK any installed door seals are approved for use on the fire-rated door-set and are functioning as intended and the gaskets are not damaged.	Annually	
11.7	Door leaves	CHECK: a) Doors are free from any visible delamination, buckling, warping, bowing, twisting or significant damage. b) Door edges are in good condition and free from any splitting or damage on all sides.	Annually	
11.8	Door frame	CHECK a) Door frames are adequately anchored to the walling and restrained against rotational movement about their longitudinal axes. b) Steel door frames are back-filled if required for the proprietary door type and FRL. c) Doorstop dimension is 25 mm or ensure that other stop dimensions are approved for the proprietary door type and FRL, or that an approved intumescent perimeter seal is not incorporated.	6 Monthly	

No	Item	Action required	Frequency	Additional information
		d) Doorframe is free from excessive distortion at any point along frame sections. e) To ensure doorframe incorporates a door striker plate. f) Rubber buffers are not present, thus creating an additional gap for smoke spread		
11.9	Vision panels	CHECK: a) Proprietary door type is approved for use of a vision panel (not allowed in Class C & D fire doors) b) Vision panel frame type, glass type and size are consistent with fire-tested approvals. c) Opening size does not exceed 100 mm (±5 mm) x 300 mm (±5 mm) or 200 mm in diameter without incorporation of a fully insulating intumescent type glass. d) To ensure glass is in a sound condition and free from cracks. e) To ensure perimeter trim and framing are secure and in sound condition and that all fixing screws are in place.	6 Monthly	
11.10	Kick plates	CHECK to ensure kickplates are securely fixed.	Monthly	

Table 2: Areas requiring inspecting, testing and maintenance

No	Item	Description	Number Note: Refers to number of deluge valves in fire system
1	Deluge fire protection systems (air actuated)	Generator, unit and turbine transformers	18
		U1-3, U4-5, U6-7, U8-10 standby transformer	4
		North and South Bulk Fuel Oil Tank and Pumphouses	6
		North and South Service Fuel Oil Tank and Pumphouses	4
2	Deluge fire protection systems (hydraulic actuated)	Electric Feed Pumps and Steam Feed Pump	18
		Main Oil Tank	8
		Diesel Generators	4
		Boiler burners	6
3	Sprinkler systems	Cable tunnel	1
		Cable spreading room	1
		North and South Incline Conveyors	2
		Understaithe Conveyors	4
		Fire pump house	1
3	Pumping system	Diesel Fire pump	1
		Jockey pump	1
		Fire water tank	1
4	Fire doors	All fire doors across the entire power station including but not limited to - All fire doors on station basement (40 ft, 112 ft, and 170 ft level) and outside plant including switchgear, equipment, battery rooms and control rooms. - Water Treatment Plant - Blue building, gigawatt park, IT server room etc	

8. AUTHORISATION

This document has been seen and accepted by:

9. REVISIONS

10. DEVELOPMENT TEAM

The following people were involved in the development of this document:

11. ACKNOWLEDGEMENTS

N/A